



CT5: ADVANCED VISUAL SIMULATION



REDIFFUSION
Simulation

CT5: A new era of visual simulation

In the past decade, users of visual simulation systems have placed increasing demands on system design to produce complex computer imagery with the flexibility to simulate a wide range of applications.

Rediffusion Simulation Incorporated, in collaboration with Evans & Sutherland, has developed a high-performance raster-scan CGI day/dusk/night visual to meet these demands. This system, called CT5, is a new architecture that departs significantly from previous CGI designs. As a result, visual simulation has moved into a new era.

Applications

Today's military flight training requirements necessitated this upward technological trend. The training is task-oriented, dedicated to increasing flight crew skills and operational readiness in such areas as air combat, in-flight refueling, terrain following, weapon delivery, hostile environments, confined area landing, aircraft carrier operations, and sensor (EVS) simulation. For these tasks, high resolution multi-channel daylight image generation is the minimum requisite.

The need for sophisticated image generation is not limited to flight training, however. Other applications include ship handling, periscope operations and engineering development simulation.

Design Objectives

The primary design objectives of CT5 were:

- High scene capacity over large fields of view.
- Unsurpassed image quality
- A modular concept, permitting expansion of channels and resolution standards
- Channel expansion that does not impact the performance of other channels
- Graceful response to overload conditions
- High availability and maintainability
- Flexibility in operational application

All these design objectives have been met and, in some cases, exceeded.

Design Features

The most important design feature of CT5 is its ability to portray very high levels of scene content through wide fields of view. This level of scene detail through multiple channels, with no loss in image quality, ensures realistic crew training. The outstanding image quality of CT5 is maintained using advanced anti-aliasing techniques.

The system's modular approach allows flexibility in resolution, field of view and number of viewpoints. In addition, multi-level overload management techniques allow consistent operation at design capacity.

Surface realism is enhanced by smooth shading, sun shading, color blending and

transparency. Light points are available to show runway lighting, beacons, strobes, VASIs, REILs and FLOLS, and atmospheric effects are portrayed with realistic visibility ranges.

The ability of CT5 to show multiple moving objects with moving parts allows full tactical simulation scenarios. One such sequence is flight formation showing own ship and other aircraft. In addition, three-dimensional textural effects provide important visual cues for judging altitude and ground speed.

CT5, the culmination of advances in CGI technology over the past decade, provides increased operational effectiveness for tomorrow's simulation.

CT5 Specifications

Modes	Day/Dusk/Night
Channels	Up to 8
Viewpoint	Single or Multiple
Field Rate	50 Hz
Resolution	Up to 1,000,000 Pixels
	Per Channel
Colors	Full Color or Monochrome

Data Base Capacity

• Per Channel Displayed	>1,000 Polygons
• Total Displayed	>2,500 Polygons
• On-Line	>15,000 Polygons
• Available	>100,000 Polygons
• Potential Scene Density	Up to 50,000 Polygons Per Square Mile

Options

- System Expansion: Channels, Windows, Viewpoints, Resolution
- Special Display Media, Including Projection
- Terrain Height
- Collision Detection
- Extra Moving Objects
- Modeling Equipment and Software
- Training Packages

Large commercial transport taxiing onto runway. Runway expansion strips demonstrate ability of CT5 to manage very small scene detail.

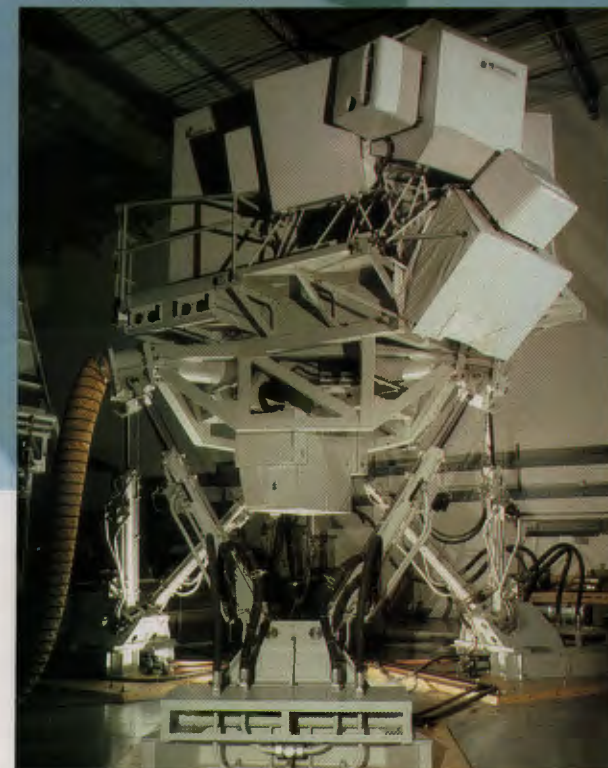


Two F-16s demonstrate unique modeling features of CT5, including color blending in afterburners and surface transparency of canopies.



First installation of CT5 visual system, fitted to CH-46E helicopter simulator.

CH-46E lead ship helicopter over mountainous terrain.





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